

Date: Wednesday, 1/31/2007 2:37:59 PM
 User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : SKID TUBE ASSEMBLY
Job Number : 30516A	
Estimate Number : 10023	
P.O. Number : <i>N/A</i>	Part Number : D205634041
This Issue : 1/31/2007 S.O. No. : <i>N/A</i>	Drawing Number : D2580 REV C
Prsht Rev. : NC	Project Number : N/A
First Issue : <i>N/A</i> Type : LANDING GEAR	Drawing Revision : C
Previous Run : 30515A	Material : <i>N/A</i>
Written By : _____	Due Date : 2/28/2007 Qty: 1 Um: Each
Checked & Approved By : <u><i>07.02.01</i></u>	
Comment : Est Rev. N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ	
Est Rev. O 06.02.28 Added paperwork EC	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
-----	----	------------------



Comment: DOCUMENT CONTROL

Photocopy D205-634 bluefile & type labels per PPP D205-634 CHG001

N/A

2.0	D25001190	Ext'n -1' Beam Tube 4"
-----	-----------	------------------------



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Pick:

Qty Part Number

Description

Batch

1 D2500-1-190

Skid Tube Extrusion

*B29602**JD 7-2-19*

3.0	D2596	205 Web
-----	-------	---------



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Pick:

Qty Part Number

Description

Batch

1 D2596

205 Web

*B29724**JD 7-2-21*

4.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
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Comment: LANDING GEAR RESOURCE 1

1- Inspect mat'l D2500-1-190 for damage

2-Cut D2500-1-190 per Dwg D2580 if necessary Deburr ends

3-Acid etch and Alodine tube per QSI 005 4.1

4-Drill pilot holes using drill jig DT 8149(Do not use cutting fluid)

*JD 7-2-19**JD 7-2-20*

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

Date: Wednesday, 1/31/2007 2:38:00 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 30516A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description:

5-Open holes to 0.500" as per Dwg D2580 without cutting fluid *fm 07-02-210*

6-Countersink holes as per Dwg D2580 without cutting fluid *fm 07-02-210*

7-Deburr and blow out all chips from inside of tube *pr 507-2-21*

8-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting *fm 50 7-2-21*

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291 *M 102672*

Sikaflex expire date: *7-2-28*

Start Time: *3:15* Date: *7-2-21*

Fin Time: *2pm* Date: *7-3-1*

5.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

> DP 7-3-1

6.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Deburr ends after cutting. Remove alodine from around holes

EL BE 0703-05

7.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

0703-060
EL BE 0703-05

8.0

D25763

Step (Machining Detail)



Comment: Qty.: 1 Each(s)/Unit Total: 1 Each(s)

Pick:

Qty Part Number Description Batch

1 D2576-3

Step

B 29486 BE 07-03-12

9.0

D2579

Crossbolt Spacer



Comment: Qty.: 20 Each(s)/Unit Total: 20 Each(s)

Pick:

Qty Part Number Description Batch

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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Drawing Name: SKID TUBE ASSEMBLY

Job Number: 30516A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description:



20

D2579

Spacers

B30220

BE

07-03-12

10.0

LARGE FAB 1

LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

1-Prepare tube for welding D2576-3 Step Remove alodine as required.

BE 07-03-12

2-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R

Aluminum Rod

M103317

BE 07-03-07

3-Weld crossbolt spacers D2579 as per Dwg. D2580 and QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R

Aluminum Rod

M103317

BE 07-03-12

4-Grind welds as per Dwg D2580 Grind flush ridge made from bending

M 07-03-07

5-Drill holes for wearplates using DT 8217 Open holes to 19/64", adjust stopper not to hit web. Deburr

M 07-03-13

6-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

M 07-03-13

7-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Deburr

M 07-03-13

8-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

M 07-03-13

11.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

07/03/13

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07/03/13

13.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Pressure wash as per QSI 005

SS

07-03-14

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
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Job Number: 30516A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

14.0

POWDER COATING

POWDER COATING



M103706



①

Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

M.H

07/03/19

15.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



20703-19



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

16.0

D25771

Wearplate Fwd



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2577-1	Wearplate	B29188

17.0

D25773

Wearplate Aft



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2577-3	Wearplate	B29960

18.0

D25775

Wearplate, Centre



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2577-5	Wearplate	B28639

19.0

ALS71032130

Insert



Comment: Qty.: 44 Each(s)/Unit Total : 44 Each(s)

Pick:

Qty	Part Number	Description	Batch
44	ALS7-1032-130	Inserts	M103495

a.m 07/03/20 ①

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
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Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 30516A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

20.0

AN960JD10L

Washer



Comment: Qty.: 44 Each(s)/Unit Total : 44 Each(s)

Pick:

Qty

Part Number

Description

Batch

4 4

AN960JD10L

Washer

M102832

21.0

AN34A

Bolt



Comment: Qty.: 44 Each(s)/Unit Total : 44 Each(s)

Pick:

Qty

Part Number

Description

Batch

44

AN3-4A

Bolt

M100857

22.0

D25941

Plug



Comment: Qty.: 16 Each(s)/Unit Total : 16 Each(s)

plug

Batch:

B29490

23.0

D25943

O-Ring



Comment: Qty.: 16 Each(s)/Unit Total : 16 Each(s)

o-ring

Batch:

B27168

24.0

D2855

Cap



Comment: Qty.: 1 Each(s)/Unit Total : 1 Each(s)

Cap

Batch:

B27488

25.0

AN35A

Bolt



Comment: Qty.: 2 Each(s)/Unit Total : 2 Each(s)

Bolt

Batch:

M15205

a.m 07/03/20

①

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: ☒ Date: 07/03/23
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

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User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 30516A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description:

26.0

AN960JD10L

Washer



Comment: Qty.: 2 Each(s)/Unit Total: 2 Each(s)

Washer

Batch: A102832

a.m 07/03/20

①

27.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Install inserts & wearplates as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R Sikaflex-291 m103497

Sikaflex expire date: 07/10

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R Sikaflex-291 m103497

Sikaflex expire date: 07/10

a.m 07/03/20

①

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

m103480

F2/a.m

Batch:

07/03/20

①

28.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

29.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D205-634-041

Location:

PPP Rev:

PPP B30846

07/03/22

①

30.0

QC21

FINAL INSPECTION/W/O RELEASE



①

Comment: FINAL INSPECTION/W/O RELEASE

07/03/23

Job Completion



u 07.03.23

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng		Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. C SHEET 1 OF 2
DATE 98.08.26		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	

RELEASED
98/09/17 DS

QTY	Part Number	Description
X	D2580-041	SKIDTUBE ASSEMBLY
*	D2500-1	EXTRUSION
1	D2596	205 WEB
1	D2575	AFT CAP
1	D2576 - 3	STEP
20	D2579	CROSS BOLT SPACER
16	D2594-1	PLUG
16	D2594-3	O-RING
1	D2577-1	WEARSHOE
1	D2577-3	WEARSHOE
1	D2577-5	WEARSHOE
44	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or ALS4-1032-130	INSERT
46	AN3-4A	BOLT
46	AN960JD10L	WASHER

98.08.28
98.08.28

EFFECTIVE DEOS
98/12/14
DEO 9124
DEO 9183

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) LENGTH OF D2500-1 EXTRUSION BEFORE BENDING = 190 INCHES *
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL $\varnothing 0.297$ HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (44 PLACES) AFTER FINISH. INSTALL AN3-4A BOLTS AND AN960JD10L WASHERS WITH SIKAFLEX-241.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

STOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT

WITHOUT NOTICE
WORK ORDER
NO. 30516A

DETAIL B
SCALE 5:24

GRIND FLUSH (4 PLACES)

GRIND FLUSH

LOCATION RIDGE ON UNDERSIDE OF D2576

STEP

D2576-3

100.08.28

100.08.28

DRILL PRIOR TO D2575 CAP
INSTALLATION (2 PLACES)

#0.208

AN3-4A BOLT (1)

AN960J10L WASHER (1)
(2 PLACES)

D2575 CAP

SEAL WITH SIKAFLEX-241

D2579 SPACER

D2596 WEB (REF)

D57-1032-130 (REF)
(TYP 44 PLACES)

AFTER PERFORMING:

1. CHANGING
2. INSPECTION
3. WEAR
4. C/B

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 30516A
D2596 WEB
57-1032-130
(17) 44 PL

[illegible]

Figure 1 is a plan view of a road layout. It shows a horizontal road segment with a 100' radius curve. The road is marked with stationing from 1+00 to 1+100. Key dimensions and features include:

- A 1.4' offset from the centerline to the edge of the road.
- A 1.0' distance between the hole and the tangent point.
- A 13.4' distance from the centerline to the hole.
- A 20.0' offset from the centerline to the edge of the road.
- A 32.0' distance from the centerline to the hole.
- A 1.1' offset from the centerline to the edge of the road.
- A note indicating a 100' radius curve.

0.5

1.5

1.5

D

P

P

P

P

P

P

P

P

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

WELD AS PER DETAIL B

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

1.5

1.5

1.5

REFER TO DETAIL C

D2577-3

D2577-5

D2577-1

8

AN3-4A BOLT (1)
AN96QJ10L WASHER (1)
(44 PLACES)

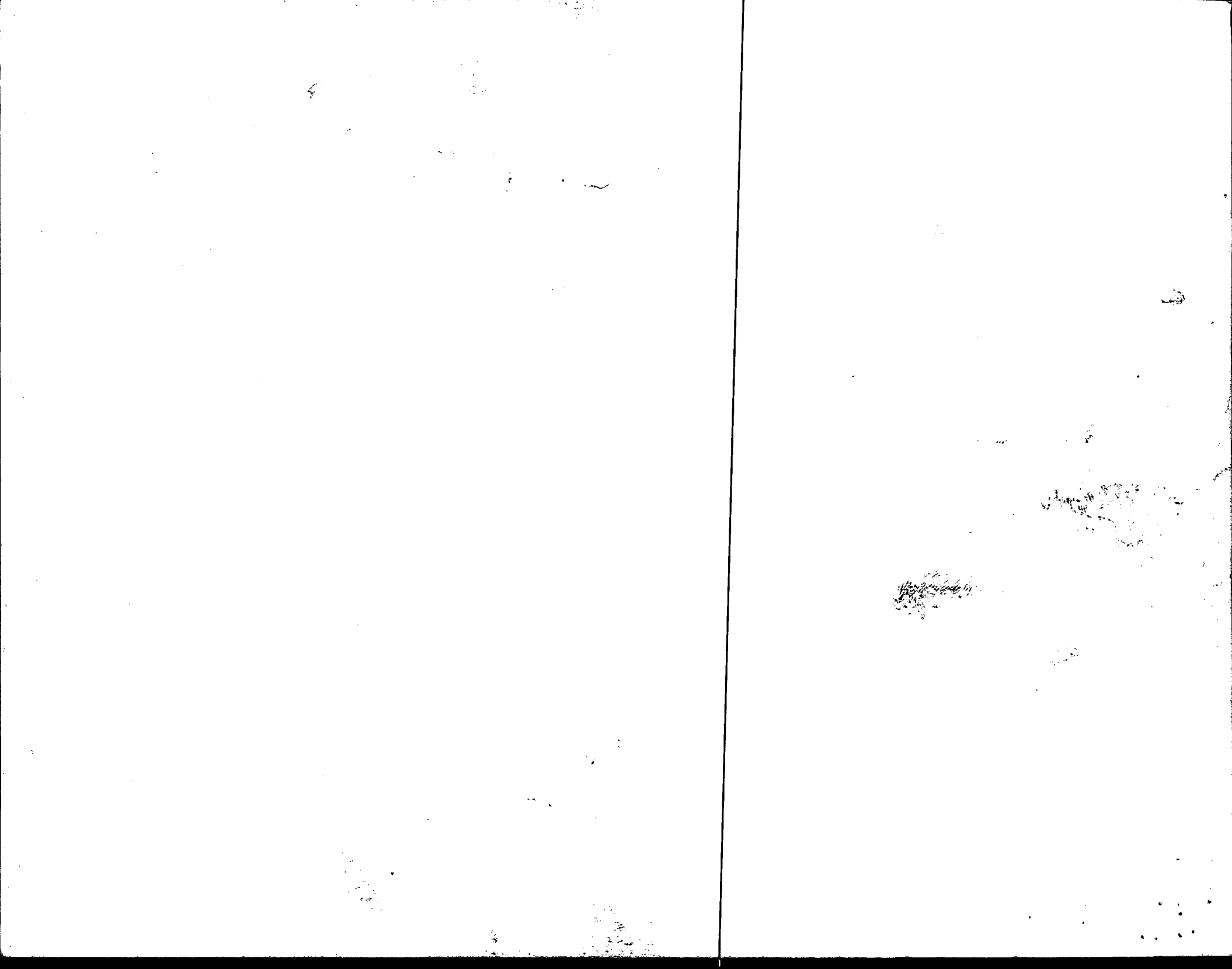
DESIGN [Signature]

DRAWN BY [Signature]

PAR

RELEASE
98/09/17 DS

Copyright 1996 by DART AEROSPACE LTD



Jason Murdoch

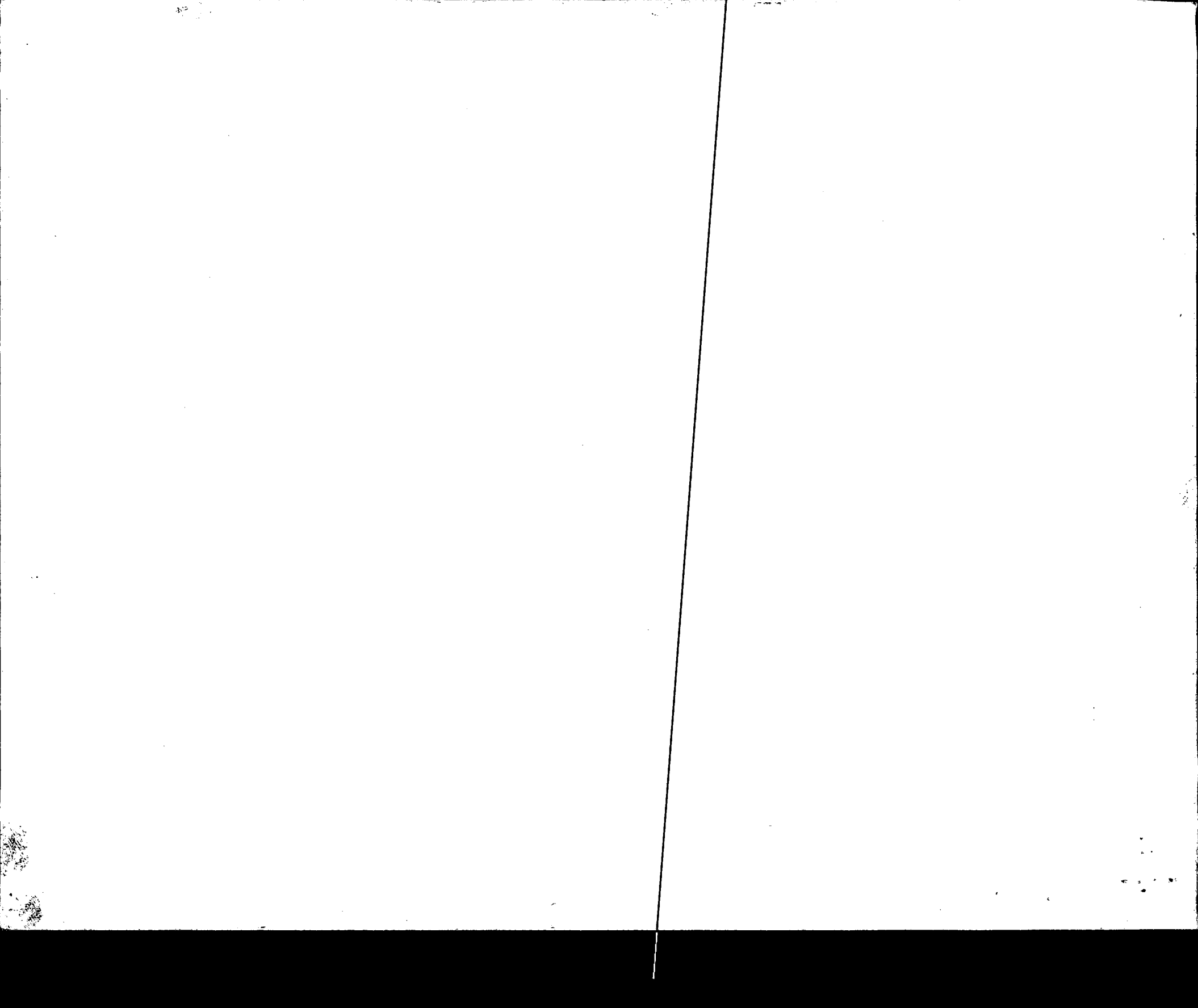
From: Bill Beckett [bbeckett@dartaero.com]
Sent: Monday, February 05, 2007 1:10 PM
To: 'Jason Murdoch'
Cc: 'L Lacelle'
Subject: RE: sikaflex-291

Jason,
Yes.
Bill

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: February 5, 2007 12:49 PM
To: 'Bill Beckett'
Subject: sikaflex-291

Bill,
We have 25 tubes of sikaflex-291, batch M102672, that expires at 02/2007. Is it acceptable to use the remainder until the end of this month?

jmurdoch@dartaero.com
Q.C. COORDINATOR



NO. 97

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name Barclay Elliott
Joint Welding Procedure Tig
Part number and Job number A205634041 / B30510 A

TEST WELDS REQUIRED

BASE METAL Alum WELDING PROCESS Tig
Penetration Complete ☐ Partial ☒ Single Weld ☒ Double Weld ☐
Current AC ☒ DC ☐ Backing YES ☐ NO ☒

	Position	Vertical	Down <input type="checkbox"/>	Up <input type="checkbox"/>
Sheet Groove	1G <input type="checkbox"/>	2G <input checked="" type="checkbox"/>	3G <input type="checkbox"/>	4G <input type="checkbox"/>
Tube Groove	1G <input type="checkbox"/>	2G <input checked="" type="checkbox"/>	5G <input type="checkbox"/>	6G <input type="checkbox"/>
Sheet Fillet	1F <input type="checkbox"/>	2F <input checked="" type="checkbox"/>	3F <input type="checkbox"/>	4F <input type="checkbox"/>
Tube Fillet	1F <input type="checkbox"/>	2F <input checked="" type="checkbox"/>	4F <input type="checkbox"/>	5F <input type="checkbox"/>

Crossbolt Spacer Welded into Skidtube

TEST RESULTS

Visual Pass ☒ Fail ☐
Penetration Pass ☒ Fail ☐
Crossbolt Spacer Pass ☒ Fail ☐

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

Date of Test Coupon 07/03/08 Qualifier David Newell